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FILE 'WSCA' ENTERED AT 15:11:42 ON 23 MAR 2000  
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=> s tocopherol  
21 FILES SEARCHED...  
28 FILES SEARCHED...  
L1 43093 TOCOPHEROL

=> s l1 and separat?  
18 FILES SEARCHED...  
L2 2438 L1 AND SEPARAT?

=> s l2 and esterify?  
37 FILES SEARCHED...  
L: 6 L2 AND ESTERIFY?

=> d ibib ab 1-6

L3 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1999:495288 CAPLUS  
DOCUMENT NUMBER: 131:131512  
TITLE: Methods for **separating** a tocotrienol from a  
tocol-containing mixture and compositions thereof  
INVENTOR(S): Sumner, Charles E., Jr.; Moncier, John D.; Kanel,  
Jeffrey S.; Foster, Mary K.  
PATENT ASSIGNEE(S): Eastman Chemical Company, USA  
SOURCE: PCT Int. Appl., 74 pp.  
CCDEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9938860	A1	19990805	WO 1999-US1571	19990126

W: BR, CN, ID, JP  
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL,  
PT, SE

PRIORITY APPLN. INFO.: US 1998-PV72962 19980129  
US 1998-PV72963 19980129

AB The invention relates to method for **separating** tocotrienol from a first tocol admixt. by heating the first tocol admixt. composed of a tocotrienol, at least one **tocopherol**, a fatty acid, and an **esterifying** compd. to **esterify** the fatty acid to produce a second tocol admixt. composed of the tocotrienol, the **tocopherol**, the esterified fatty acid, and the unesterified fatty acid; distg. the second tocol admixt. with the esterified fatty acid to remove the unesterified fatty acid from the second tocol admixt. to produce a third tocol admixt. composed of the tocotrienol and the **tocopherol**, with substantially removed unesterified fatty acid; distg. the third tocol admixt. for a sufficient time and temp. to substantially remove the tocotrienol and **tocopherol** from the third tocol admixt. to

produce a fourth tocol admixt. composed of the removed tocotrienol, **tocopherol**, and a non-tocol component; and extg. the tocotrienol from the fourth tocol admixt. with an extn. solvent composed of a polar, org. solvent that is miscible with water to produce a two phase system composed of a first phase contg. the majority of the extn. solvent and the second phase, wherein the selectivity of the extn. solvent for tocotrienol with respect to the **tocopherol** is greater than unity, and removing the first phase from the second phase, with the proviso that the extn. solvent is not a neat alc. The invention further relates to compns. produced by the methods of the present invention.

L3 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2000 ACS  
 ACCESSION NUMBER: 1999:495287 CAPLUS  
 DOCUMENT NUMBER: 131:131511  
 TITLE: Methods for **separating** a tocol from a tocol-containing mixture  
 INVENTOR(S): Sumner, Charles E., Jr.; Moncier, John D.; Kanel, Jeffrey S.; Foster, Mary K.  
 PATENT ASSIGNEE(S): Eastman Chemical Company, USA  
 SOURCE: PCT Int. Appl., 73 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9938859	A1	19990805	WO 1999-US1570	19990126
W: BR, CN, ID, JP FW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GE, GR, IE, IT, LU, MC, NL, PT, SE				
PRIORITY APPLN. INFO.:			US 1998-PV72962 US 1998-PV72963	19980129 19980129

AB The invention relates to a method for **sepg.** tocol from a tocol-contg. admixt. by heating the tocol-contg. admixt. composed of a tocol, a fatty acid, and an **esterifying** compd. to **esterify** the fatty acid to produce a second tocol admixt. composed of the tocol, the esterified fatty acid, and the unesterified fatty acid; distg. the tocol-contg. admixt. with the esterified fatty acid to remove the unesterified fatty acid from the tocol admixt. to produce a tocol admixt. composed of the tocol with substantially removed unesterified fatty acid; distg. the tocol admixt. for a sufficient time and temp. to substantially remove the tocol from the tocol admixt. to produce a tocol admixt. composed of the removed tocol and a non-tocol component; and

extg.

the tocol from the tocol admixt. with an extn. solvent composed of a polar, org. solvent that is miscible with water to produce a two phase

system composed of a first phase contg. the majority of the extn. solvent

and the second phase, wherein the selectivity of the extn. solvent for

tocol with respect to the non-tocol component is greater than unity, and

removing the first phase from the second phase, with the proviso that the extn. solvent is not a neat alc.

L3 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2000 ACS

ACCESSION NUMBER: 1990:503371 CAPLUS

DOCUMENT NUMBER: 113:103371

TITLE: Recovery of carotenoids, **tocopherols**, tocotrienols and sterols from esterified palm oil

INVENTOR(S): Goh, Swee Hock; Kam, Toh Seok; Choo, Yen May; Ong,

Augustine Soon Hock

PATENT ASSIGNEE(S): Institut Penyelidikan Minyak Kelapa Sawit Malaysia,

Malay.; University of Malaya

SOURCE: Brit. UK Pat. Appl., 21 pp.

CODEN: BAKXDU

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 218989	A1	19891129	GB 1988-29427	19881215
GB 218989	B2	19910904		

PRIORITY APPLN. INFO.: GB 1987-29232 19871215

AB A method for the isolation of the minor nonglyceride components of palm

oil or similar vegetable oil contg. free fatty acid and nonglyceride components similar to that of palm oil comprises: (a) **esterifying** the free fatty acid component of the oil with .gtoreq.1 monohydric alcs.

to form an esterified oil with a very low free fatty acid content;

(b) converting the glycerides into monoesters by transesterification using

.gtoreq.1 monohydric alc.; (c) adsorbing the nonglyceride components onto

a selective adsorbent to **sep.** them from the esters; and (d) desorbing the nonglyceride components from the adsorbent. The adsorbent

is preferably activated alumina, activated C, or silica gel. By the method, carotenes, sterols, **tocopherols** and other nonglyceride components can be isolated. Crude palm oil Me ester was dissolved in MeOH

and applied to a C18 reversed-phase column. The esters were eluted

with

MeOH, and then carotenoids were eluted with C6H14: MeOH (98:2  
vol./vol.)  
or CHCl3.

L3 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1988:114619 CAPLUS  
DOCUMENT NUMBER: 108:114619  
TITLE: Concentration of **tocopherols** from soybean  
sludge by supercritical fluid extraction  
AUTHOR(S): Shishikura, Akihiro; Fujimoto, Kenshiro; Kaneda,  
Takashi; Arai, Munio; Saito, Shozaburc  
CORPOFATE SOURCE: Fac. Agric., Tohoku Univ., Sendai, Japan  
SOURCE: Yukagaku (1988), 37(1), 8-12  
CODEN: YKGKAM; ISSN: 0513-398X  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB **Sepn.** of **tocopherols** from soybean sludge (byproduct of  
soybean oil deodorization) by supercrit. carbon dioxide (SC-CO2) and  
nitrous oxide (SC-N2O) was carried out. This **sepn.** was not  
possible by supercrit. fluid (SCF) alone and consequently, it was  
necessary to **esterify** the sludge with EtOH. **Tocopherols**  
could be concd. by >64%. The **tocopherols** could be recovered by  
90% in this fraction by SC-CO2 extr. in conjunction with a silica gel  
column and simple pretreatment. The silica gel column could be  
regenerated for the most part by extrn. with an entrainer, such as  
EtCH.

L3 ANSWER 5 OF 6 CEABA COPYRIGHT 2000 DECHEMA  
ACCESSION NUMBER: 1988:771818 CEABA  
TITLE: Concentration of tocophenols from soybean sludge  
by  
AUTHOR: Shishikura, A.; Fujimoto, K.; Kaneda, T.; Arai,  
K.;  
Saito, S.  
SOURCE: Yukagaku (1988) 37(1(392)), p.8-12  
CODEN: YKGKAM ISSN: 0513-398X  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB **Separation** of **tocopherols** from soybean sludge by  
supercritical carbon dioxide (SC-CO2) and nitrous oxide (SC-N2O) was  
carried out. This **separation** was not possible by supercritical  
fluid (SCF) alone and consequently, it was considered necessary to  
**esterify** the sludge with ethanol. Greater **separation**  
was possible using sludge esterified free fatty acid with ethanol.  
**Tocopherols** could be concentrated by more than 64 %. The  
**tocopherols** could be recovered by 90 % in this fraction by SC-CO2  
extraction in conjunction with a silicic acid column and simple  
pretreatment. This silicic acid column could be regenerated for the  
most  
part by extraction with an entrainer, such as ethanol. (Author)

ACCESSION NUMBER: 880172978 JICST-EPlus  
TITLE: Concentration of **tocopherols** from soybean sludge  
by supercritical fluid extraction.  
AUTHOR: SHISHIKURA A; FUJIMOTO K; ARAI K; SAITO S  
KANEDA T  
CORPORATE SOURCE: Tohoku Univ., Sendai-shi, JPN  
Koriyama Women's Coll., Koriyama-shi, JPN  
SOURCE: Yukagaku (Journal of the Japan Oil Chemists' Society),  
(1998) vcl. 37, no. 1, pp. 8-12. Journal Code: G0238A  
(Fig.  
7, Tbl. 2, Ref. 17)  
COLEN: YKGKAM; ISSN: 0513-398X  
PUB. COUNTRY: Japan  
DOCUMENT TYPE: Journal; Article  
LANGUAGE: English  
STATUS: New  
AB **Separation** of **tocopherols** from soybean sludge by  
supercritical carbon dioxide(SC-CO<sub>2</sub>) and nitrous oxide(SC-N<sub>2</sub>O) was  
carried  
out. This **separation** was not possible by supercritical  
fluid(SCF) alone and consequently, it was considered necessary to  
**esterify** the sludge with ethanol. Greater **separation** was  
possible using sludge esterified free fatty acid with ethanol.  
**Tocopherols** could be concentrated by more than 54%. The  
**tocopherols** could be recovered by 90% in this fraction by SC-CO<sub>2</sub>  
extraction in conjunction with a silicic acid column and simple  
pretreatment. The silicic acid column could be regenerated for the  
most  
part by extraction with an entrainer, such as ethanol. (author abst.)

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FILE 'AGRICOLA, ALUMINIUM, ANABSTR, APILIT, BIGCOMMERCE, BIOTECHNO,  
CAFA,  
CAOLD, CAPLUS, CBM&B, CEABA, CEN, CEFAB, CIN, CCMPENDEX, CONFSCI,  
GENBANK,  
INSPEC, INSPHYS, INVESTEXT, IPA, JICST-EPLUS, KKF, KOSMET, METADEX,  
NAPRALERT, NIOSHTIC, NTIS, PAPERCHEM2, ...' ENTERED AT 15:11:42 ON 23  
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2000

L1 43093 S TOCOPHEROL  
L2 2438 S L1 AND SEPARAT?  
L3 6 S L2 AND ESTERIFY?

= s l2 and extract?  
18 FILES SEARCHED...

L4 734 L2 AND EXTRACT?

= s l4 and distil?  
27 FILES SEARCHED...

L5 36 L4 AND DISTIL?

= s l5 and esterif?  
L6 7 L5 AND ESTERIF?

= d ibib ab 1-7

L6 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1999:495288 CAPLUS  
DOCUMENT NUMBER: 131:131512  
TITLE: Methods for **separating** a tocotrienol from a  
tocol-containing mixture and compositions thereof  
INVENTOR(S): Summer, Charles E., Jr.; Moncier, John D.; Kanel,  
Jeffrey S.; Foster, Mary K.  
PATENT ASSIGNEE(S): Eastman Chemical Company, USA  
SOURCE: PCT Int. Appl., 74 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	---	-----	-----	-----
WO 9938860	A1	19990805	WO 1999-US1571	19990126
W: BR, CN, ID, JP				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,				
NL,				
PT, SE				
PRICRITY APPLN. INFO.:			US 1998-PV72962	19980119
			US 1998-PV72963	19980119

AB The invention relates to method for **sepg.** tocotrienol from a first tocol admixt. by heating the first tocol admixt. composed of a tocotrienol, at least one **tocopherol**, a fatty acid, and an **esterifying** compd. to **esterify** the fatty acid to produce a second tocol admixt. composed of the tocotrienol, the **tocopherol**, the **esterified** fatty acid, and the unesterified fatty acid; **distg.** the second tocol admixt. with the **esterified** fatty acid to remove the unesterified fatty acid from the second tocol admixt. to produce a third tocol admixt. composed of the tocotrienol and the **tocopherol**, with substantially removed unesterified fatty acid; **distg.** the third tocol admixt. for a sufficient time and temp. to substantially remove the tocotrienol and **tocopherol** from the third tocol admixt. to produce a fourth tocol admixt. composed of the removed tocotrienol, **tocopherol**, and a non-tocol component; and **extg.** the tocotrienol from the fourth tocol admixt. with an **extn.** solvent composed of a polar, org. solvent that is miscible with water to produce a two phase system composed of a first phase contng. the majority of the **extn.** solvent and the second phase, wherein the selectivity of the **extn.** solvent for tocotrienol with respect to the **tocopherol** is greater than unity, and removing the first phase from the second phase, with the proviso that the **extn.** solvent is not a neat alc. The invention further relates to compns. produced by the methods of the present invention.

L6 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1999:495287 CAPLUS

DOCUMENT NUMBER: 131:131511  
TITLE: Methods for separating a tocol from a tocol-containing mixture  
INVENTOR(S): Sumner, Charles E., Jr.; Moncier, John D.; Kanel, Jeffrey S.; Foster, Mary K.  
PATENT ASSIGNEE(S): Eastman Chemical Company, USA  
SOURCE: PCT Int. Appl., 73 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
WO 9938859	A1	19990805	WO 1999-US1570	19990126
W: BF, CN, ID, JP				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				
PT, SE				

PRIORITY APPLN. INFO.: US 1998-PV72962, 19980129  
                          US 1998-PV72963, 19980129

AB The invention relates to a method for **sepg.** tocol from a tocol-contg. admixt. by heating the tocol-contg. admixt. composed of a tocol, a fatty acid, and an **esterifying** compd. to **esterify** the fatty acid to produce a second tocol admixt. composed of the tocol, the **esterified** fatty acid, and the unesterified fatty acid; **distg.** the tocol-contg. admixt. with the **esterified** fatty acid to remove the unesterified fatty acid from the tocol admixt. to produce a tocol admixt. composed of the tocol with substantially removed unesterified fatty acid; **distg.** the tocol admixt. for a sufficient time and temp. to substantially remove the tocol from the tocol admixt. to produce a tocol admixt. composed of the removed tocol and a non-tocol component; and **extg.** the tocol from the tocol admixt. with an **extn.** solvent composed of a polar, org. solvent that is miscible with water to produce a two phase system composed of a first phase contg. the majority of the **extn.** solvent and the second phase, wherein the selectivity of the **extn.** solvent for tocol with respect to the non-tocol component is greater than unity, and removing the first phase from the second phase, with the proviso that the **extn.** solvent is not a neat alc.

L6 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1997:533639 CAPLUS  
DOCUMENT NUMBER: 127:190871  
TITLE: Method of producing (.-.-)-**tocopherol** or (.-.-)-**tocopheryl acetate**  
INVENTOR(S): Jaedicke, Hagen; Grafen, Paul; Laas, Harald  
PATENT ASSIGNEE(S): Basf A.-G., Germany; Jaedicke, Hagen; Grafen, Paul;

SOURCE: Laas, Harald  
PCT Int. Appl., 21 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9728151	A1	19970807	WO 1997-EP324	19970124
W: CN, JP, RU, SK, US				
PT, SE				
DE 19603142	A1	19970731	DE 1996-19603142	19960129
DE 19617444	A1	19971106	DE 1996-19617444	19960502
EP 882036	A1	19981209	EP 1997-901601	19970124
F: CH, DE, FR, GB, LI				
PRIORITY APPLN. INFO.:			DE 1996-19603142	19960129
			DE 1996-19617444	19960502
			WO 1997-EP324	19970124

OTHER SOURCE(S): CASREACT 127:190871

AB A method is disclosed of producing (+--)-alpha.-**tocopherol** or (-+-)-alpha.-**tocopheryl acetate** by acid catalyzed reaction of 2,3,5-trimethylhydroquinone (TMH) with phytol or isophytol (IP) in a solvent at raised temp. and, where appropriate, subsequent **esterification** of the **tocopherol** thus obtained with acetic anhydride. The method is characterized in that the reaction is carried out in an optionally substituted cyclic five-ring carbonate such as 1,2-propylene carbonate, or in an optionally substituted five-ring lactone such as .gamma.-butyrolactone, as the solvent at temps. of between 50 and 200.degree.. The reaction works particularly well if, following the reaction of TMH and phytol or IP, the **tocopherol** which **separates** out as an upper phase as the reaction mixt. cools and/or the reaction mixt. is **extd.** using a suitable aliph. hydrocarbon, the **tocopherol** is isolated by **distn.** from the **ext.**, and the **sep'd.** cyclic carbonate or .gamma.-lactone which can contain excess TMH and acidic catalyst is reused as solvent. In many cases, it has been shown to be advantageous to carry out the reaction of TMH with phytol or IP with removal of the water as azeotrope, using a suitable hydrocarbon and/or in the presence of a mixt. of ortho-boric acid with oxalic acid, tartaric acid or citric acid, or alternatively in the presence of BF3 etherate as the acidic catalyst. Surprisingly, the five-ring carbonates and five-ring lactones prove to have sufficient stability under the reaction conditions and suitable solvent characteristics to permit the process to be carried out continuously.

ACCESSION NUMBER: 1991:5295 CAPLUS  
 DOCUMENT NUMBER: 114:5295  
 TITLE: Technology for **separating** vitamin E from the residues of vegetable oil refining  
 INVENTOR(S): Qu, Delin; Chen, Peirong; Su, Jianmin  
 PATENT ASSIGNEE(S): Tsinghua University, Peop. Rep. China  
 SOURCE: Faming Zhuanli Shengqing Gongkai Shuomingshu, 11  
 PP.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1034367	A	19890802	CN 1987-106187	19870917
CN 1013197	B	19910717		

AB The title named involves: (1: **esterification** of plant (e.g. soybean) residue with EtOH in MeOH at 60-80.degree. for 4 h, (2) washing the reaction product with 60-70.degree. water until the water is neutral, (4) vacuum-**distn.** of the resultant product to give vitamin E, (4) repeating steps of (1) to (3), (5) **extg.** the crude **distillate** with MeOH on MeOH-acetone, (6) allowing to stand to ppt. and removing the ppt., (7) chromatog. of the supernatant on silica gel, and (8) chromatog. on strongly basic cation exchangers (not specified).

LF ANSWER 5 OF 7 CAPLUS COPYRIGHT 2000 ACS  
 ACCESSION NUMBER: 1974:567970 CAPLUS  
 DOCUMENT NUMBER: 81:167970  
 TITLE: Utilization of deodorized condensates from

vegetable oils  
 AUTHOR(S): Kim, Jum Sik  
 CORPORATE SOURCE: Coll. Eng., Hanyang Univ., Seoul, S. Korea  
 SOURCE: Taehan Hwahak Hoechi (1974), 18(4), 297-301  
 CODEN: DHWHAB

DOCUMENT TYPE: Journal  
 LANGUAGE: Korean  
 AB The condensates were heated to **sep.** the oil from the water, and the oil was removed. After Me **esterification**, the oil was **dstd.** to remove fatty acids. The oil was then saponified and the unsaponifiable matter was **extd.** with hot MeOH and concd. The sterols were crystd. from the concd. soln. The mother liquor was dissolved in MeOH and cooled to -20.degree. to remove residual fatty acids.

**Tocopherols** were then **sep'd.** with an ion exchange resin.

LF ANSWER 6 OF 7 CAPLUS COPYRIGHT 2000 ACS  
 ACCESSION NUMBER: 1971:491267 CAPLUS  
 DOCUMENT NUMBER: 75:91267  
 TITLE: Process report on vitamins. IV  
 AUTHOR(S): Ganju, Atar

CORPORATE SOURCE: India  
SOURCE: Indian Chem. J. (1971), 5(10), 40-3  
CODEN: ICLJAG  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Five techniques for isolation of **tocopherols** from animal and vegetable fat deodorizer sludge are reviewed: (1) **esterification** of the 20% sterols, 8 **tocopherols**, 20% fatty acid-triglyceride mixt., **sepn.** of the resulting esters by **distn.**, and alc. wash of the residue to remove the sterols; (2) sapon. of the mixt., **sepn.** of unsaponifiable matter (**tocopherols** and sterols), and wash **sepn.**; (3) **sepn.** of **tocopherols** by chloromethylation and redn.; (4) fractional liq.-liq. **extn.**; (5) ion exchange.

L6 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2000 ACS  
ACCESSION NUMBER: 1967:412811 CAPLJS  
DOCUMENT NUMBER: 67:12811  
TITLE: Utilization of [vegetable oil] concentrate containing

chromatography **tocopherols. I. Separation of**  
concentrate components by thin-layer

AUTHOR(S): Takeuchi, Takahiro; Tatsukawa, Toyokazu  
CORPORATE SOURCE: Ind. Fes. Inst., Kobe, Japan

SOURCE: Yukagaku (1967), 16(4), 185-93  
CODEN: YKGKAM

DOCUMENT TYPE: Journal  
LANGUAGE: Japanese

AB It is generally accepted that the deodorized condensates obtained in the

refining of vegetable oils contain 1-10% **tocopherols**. The condensates are good raw materials for prepn. of .alpha.-**tocopherol** or **tocopherol** concentrates. The concentrate containing 42.6% .alpha.-type **tocopherols** was prep'd. by **esterification** and **distn.** of the soybean oil condensate.

Thin-layer chromatog. was used to analyze the concentrate components prior

to studies on utilization of the concentrate. For analysis of these components, nonpolar and polar developing solvent systems were at least

necessary. Hydrocarbons, squalene, and 5 other unkown components were

**sepd.** from each other in nonpolar solvent systems, such as naphtha. On the contrary, .alpha., .gamma., and .delta.-**tocopherol**, higher alcs., and sterols were **sepd.**, each giving **sep.** spots in polar solvent systems, such as C<sub>6</sub>H<sub>14</sub>-Et<sub>2</sub>O (7:3 by vol.). These spots could be detected by uv illumination and spraying with solns. such as icdine-C<sub>6</sub>H<sub>6</sub>, 50% H<sub>2</sub>SO<sub>4</sub>, or Emmerie-Engel reagent. 20 references.

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COST IN U.S. DOLLARS

SINCE FILE TOTAL  
ENTRY SESSION

FULL ESTIMATED COST	88.90	89.11
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-6.12	-6.12

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